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CHILD PSYCHOLOGY AND PEDAGOGY

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The scientific study of the mental life of young children has a special difficulty with which to contend. The animal psychologist may gather his specimens in quantities and do with them what he will, and the student of older children or of adults finds them in schools and colleges, and finds them capable of undergoing systematic investigation. But young children are normally found in individual homes where they must be observed rather than experimented upon. This means that child psychology must be built up in part by isolated, sometimes by untrained observers. Moreover, many of those who know children best publish books of a practical nature in which the reader is left to sift out the psychology from the pedagogy if he is so disposed.

Treatises.—Among recent books which are general in scope is that of the Gesells (13). Several of the chapters in the more purely psychological part of the book are excellent, especially the ones on "The Hand" and on "Touch." In the part entitled "The Pedagogy of the Primary School" there is also psychological material. These chapters, notably those on Drawing, Dramatic Expression and Handwriting, contain a great deal of good sense and enlightened opinion. A number of original devices are presented in connection with the different subjects of the curriculum. Thus the rhythmic movements preparatory to writing seem particularly well planned. A work much more pretentious in title is Jacoby's (18) which is professedly written for educators, to give them a knowledge of those subjects which border on both medicine and

pedagogy. The book should be stimulating to the lay reader, and is not without value for the teacher. Some specific points are given for the diagnosis and treatment of feeble-minded children. Still, the treatment of topics is, on the whole, far too cursory to entitle the book to consideration as a real contribution to a scientific pedagogy. Hallam's (15) studies of child development is a simple, direct little treatise. It does not purport to offer original material, but is an adaptation of reliable results to the use of mothers' and of child study clubs. It seems admirable for such a purpose. Hillyer's (17) book is a program of specific drills. It gives little of psychological discussion or pedagogical theory, and that little is not always sound. The spirit of the book is illustrated in exercise 19 (p. 32) which reads: "Scatter waste paper, blocks, toys, on the floor and have the children pick them up, put paper in scrap basket, and blocks, etc., where they belong." As a kind of reference list for games and maxims it is not without use. Stoner's (33) is a much talked about book and a delightful one—the account of Mrs. Stoner's training of her daughter Winifred. To its documentary interest is added much in the way of general discussion. This child's unusual accomplishments seem entirely credible as one realizes in reading the book the mother's very uncommon resources of tact, patience and imagination. Mrs. Stoner's book is as remarkable for its common sense and sanity as for the experiment in child training which it records. Barnesby's (2) is the work of a physician who offers a brief manual of practical suggestions for the early care of children. It gives important elementary instruction on symptoms of children's diseases, and contains chapters on Eugenics and on School Inspection. It is not primarily a book for teachers but is one that a physician might wish to put into the hands of a young mother. McKeever (22) publishes a text-book for parent-teachers' associations, mothers' clubs and like groups. He discusses matters of organization and direction of such groups, but so far as child psychology or pedagogy are concerned the book is indeed all outline. McCracken (21) gives, with literary finish, a series of anecdotes about children in their home life, school life and church life. Hers is not in any sense a technical book, and yet its incidents may be taken by the psychologist, if he will, as so much protocol.

The Montessori Method.—The continued interest in the Montessori ideas has produced a number of new books and articles. Stevens (32) gives a faithful presentation of the Montessori prin-

ciples and spirit. In her own trial of the didactic materials, however, she cites an experience which suggests a crucial criticism of the method. "John," she writes (p. 221), "would choose the Tower, Big Stair, or Long Stair, but wished to use them in his own way to build a railroad track or a train of cars. Only gradually did he use them intelligently." Whether this misappropriation of John's is to be permitted or suppressed is an important point in the interpretation of the Montessori principle of freedom. Mrs. Stoner, in the above quoted book, predicts that the Montessori system will not last because it fails to encourage such imaginative play. On the other hand Miss Sayre (30) reveals surprising possibilities for artistic activity in the use of the geometrical insets. She describes the artistic value of the Montessori geometrical insets and the stages by which a class of children arrived at free-hand drawing. One day a child designing at the board with the oval inset cried out, "I've drawn a tulip." "A great deal of interest was now manifested in the portrayal of various flowers by means of the insets. It was imagination that supplemented the material, for the children had not thought of using a real flower as a model." A child brought a bunch of magnolias to school and several others wanted to draw them. "One studied the shape of the petals and selected the ellipse, another the oval, while a third child used the spherical triangle and being dissatisfied with the result erased the flower and *drew it free hand.*" Boyd (6) traces the history of some of the Montessori principles from Locke. He finds, for example, that the work of Pereira in training deaf mutes suggested to Rousseau the idea that these methods of educating defectives could be extended to the training of normal children. He criticizes the education of the senses as follows (p. 237): "Misled by psychological analogies and by the practice of the psychological laboratory, Montessori assumes that the senses as the simplest elements of mind come to an early perfection in individual development, and interprets the child mind as though it were dominated by its sensory experiences." Boyd also finds the system lacking in "direct esthetic and moral appeal to the child." Ward (35) gives a clear and detailed account of the Montessori system in operation. She may be called a "follower" although her book is more than a mere exposition. It compares the work of Montessori with that of the American Kindergarten, and the book is enriched by references to other pedagogical writers. On the whole the keenest and clearest appraisal of the system in its psychological implications is that of Kilpatrick (19),

who concerning sense training concludes: "The training got with each of the several pieces of the didactic apparatus is genuine, but highly specialized, and along lines for the most part so removed from ordinary life conditions that the probability of its functioning directly as skill is very remote." His general comment is "Stimulating she is; a contributor to our theory, hardly, if at all."

Child Hygiene.—The field of child hygiene has been notably enriched by Terman (34), who has digested and represented in more usable form a great deal of medical and pedagogical research. There are chapters on general laws of growth and disorders of growth, followed by chapters on more special fields, as the teeth of school children, hygiene of the nose, throat, ear, etc. One of the most interesting parts treats of the sleep of school children. Noyes (26) publishes a mother's diary of her child's first two years. Records of nine critical months are presented in some detail, *i. e.*, months in which special problems like teething and weaning had to be met. Summaries and charts for the entire two years are given, including items relating to diet, sleep, excretions, etc. Also curves of height, weight, head measurements, girth of chest, neck, etc., are shown. It is a valuable and a readable little monograph.

Special Aspects of Child Psychology.—Of the articles bearing on special aspects of child psychology a large proportion is concerned with speech development. Several vocabulary studies are reported. Rowe and Rowe (29) give the total number of words used by their child as 2,346 at the age of four and 3,950 at the age of six. Heilig (16) gives a list of 2,153 for a girl of three years. He adds notes also on her musical development thus: "At fourteen months she sang the whole scale with absolute accuracy, alone and unprompted. From the fourteenth month she could strike at once with her voice any tone sounded on the piano." Bush (7) compares the vocabulary of a three-year-old girl with Whipple's boy of three. The girl's total number of words is 1,944 as against Whipple's 1,771. The percentages of various parts of speech to the whole vocabulary are fairly close to those recorded by Whipple but "the principal advantages the girl B has over the boy R seems to be in the use of verbs, she having a numerical excess of 115." Bohn (4) records the first use of sentences by a girl. The first which could be called a sentence, both in form and function, he says, came in the fifteenth month. The total vocabulary at 27 months was 969 words. Boyd (5) presents a classified vocabulary of a girl, the total number of words being 1,657 at the age of three years and 2,598 at the

age of four. Beyer (3) reports the vocabulary of a boy of two years as being 771 words. Drever (10) gives results for three children, a boy of 54½ months with 1,712 words, a girl of 43 months with 824 words, and a boy of 28 months with 345 words. Snyder (31) gave special attention to sentence types. She found a large proportion to be imperatives. Many declaratives and interrogatives were also clearly imperatives in their intent. This child's definitions "gave the habitual activity or employment of a thing." The development of the negative confirmed the observations of Sully, Major, *et al.* Grant (14) gives curves of growth of a (girl's) vocabulary, up to her 26th month, the total being 1,201 words. The study includes a comparative table of vocabularies cited from some fifteen or so authorities. Nice (24) studied the vocabulary of a girl of three as determined by environment. "This child got her words at first largely from personal experience." The same writer, Nice (25), tells of a left-handed girl who was prevented from using her left hand until she was two years old. At that time she had showed no sign of talking and the attempt to make her right-handed was given up. The child learned to excel in the use of her hands and at the age of three and a half years showed a spontaneous and marked improvement in speech. Apropos of the point made by Ballard in "Sinistrality and Speech" (*Journal of Experimental Pedagogy*, 1912) Lippert (20) submits a very brief statement on three left-handed boys. All of them had learned to write with the right hand but none had any speech defect. Eng (11) has made a study of abstract concepts in the speech and thought of the child. She cites the observation made by others that the child's correct use of numerals is often restricted to some special objects, and she generalizes this observation, *i. e.*, she points out that this is what happens at first in the child's use of any abstract concept. She found children's associative reactions to abstract stimulus words to be nearly twice as long as to concrete words. She, furthermore, tested children ranging in age from 10 to 14 years, on their comprehension of abstract words in isolation and in context. She found that if a child did not know a word in isolation he was not likely to be helped much when he got it in context, though the influence of context increased slightly with the child's age. Mead (23), on the basis of returns from 25 boys and 25 girls, all normal children, says that "boys begin to walk at 13.875 months (using the median as a measure of central tendency) with a probable error of .97 months; and begin to talk at 16.5 months, with a probable

error of 2.75 months. Girls begin to walk at 13.21 months, with a probable error of 1.12 months; and begin to talk at 15.5 months, with a probable error of 2.68 months." Figures are also given for the feebleminded.

Several titles referring to children's play should be mentioned. Folsom (12) writes: "My interest in things scientific seemed to develop in exactly the reverse of the recapitulatory order expounded by Dr. G. Stanley Hall. I was first of all interested in pure science —I wanted to know the facts and was irritated when the information was diluted with mythical, personal, or heroic interpretations." Day (9) gives the story of the geographical, political and industrial peculiarities of a boy's make-believe world. It shows how his imagination was colored by the practical and scientific character of his surroundings. It is not an account of a child's notion of deity, as the title might suggest. Reaney (28) found that "a definite correlation exists between general ability and play ability for group games." Parsons (27) calls attention to the fact that in nursery plays for boys the soldier ideal is too constantly and too exclusively held up and that "it is ever those earliest associations which are the hardest to sever, the most resistant to reason." She suggests that the ideal of the engineer, life-saver, fireman, forest ranger, etc., be substituted.

Watkins (36) tested 10 boys and 10 girls, 5 of each being "bright" and the other 5 "dull," upon their immediate memory for rows of nonsense syllables and of digits. He confirms other writers in that "the influence of perseveration and of regressive inhibition, whilst not in themselves indicative of backwardness, are, however, more marked in the case of backward than of intelligent children." Moreover, "intelligent children apprehend the row (of syllables) as a complex whole. . . . Backward children tend to learn each unit as isolated and almost as self-complete." Ballard (1) reports that "when a young child has imperfectly memorized a passage of poetry, he is, as a rule, able to remember more of it after the lapse of a few days than he does immediately after learning. . . . As a general rule, children of six years of age improve to the extent of 50 or 60 per cent. in two days, children of twelve improve from 10 to 20 per cent.; subjects over twenty years of age do not improve at all."

Cook and O'Shea (8) upon testing high school and college students in spelling, with a view to determine the value of knowing spelling rules, concluded that "not a single rule tested proved to

be of real value except the one . . . relating to the final *ie*." They try to analyze the sources of poor spelling and also the characteristics of the good speller. The writers leave the impression that differences in imagery habits are unimportant. No one of their four principal subjects showed himself to be predominantly of one type. Such a number, however, is probably far too small to show any correlation between imagery habits and spelling capacity.

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ADOLESCENCE

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Treatises.—Several books of a quasi-scientific nature on the psychology and pedagogy of adolescence have appeared during the past two years in the form of texts for reading circles, teachers' associations and normal schools, and one of particular merit in this line is that of King (**31**) which gives an intimate first-hand appreciation, in an elementary and popular form, of the high school pupil's physical, social and mental characteristics with educational corollaries and directions for teachers, based primarily on good auxiliary literature and experiments by the author. Kelynack (**30**) has edited a small volume containing suggestive material on the psychology of youth and similar discussions on hygiene, recreations, disorders and habits. Forbush's (**16**) study of the adolescent boy in the

home is a new book of particular value to parents with special reference to institutes and boys' clubs, and this author's handbook for the members of the American Institute of Child Life (**17**) is a well-classified outline of annotated psycho-sociological and educational references on adolescence. In a comprehensive study of the origin and classification of children's clubs, Varendonck (**55**) has made a significant contribution to the study of the social instincts of adolescence. Fiaux (**15**) has published a good general treatise and Barnes (**6**) an outline of his lectures, of which several are on adolescence.

Experimental Studies.—From the standpoint of scientific contributions to adolescent psychology, with particular reference to the genetic aspects of physical and mental development, Woolley and Fischer's (**58**) monograph based on about 800 working children of fourteen years of age is of marked constructive value, since 679 of the children were retarded at the age of fifteen in height, weight, lung capacity, steadiness of hand, rote memory, association, completion of sentences, association of cause and effect, tapping, card sorting, substitutions, form boards and puzzle boxes. Positive correlations were found between school grade and each mental test with the range of distribution from the lowest to the highest, extending from the puzzle box, cancellation, substitution, sentence test and association of opposites to memory, respectively, which ranked the highest. An active laboratory force is at work in Cincinnati on these problems and similar work has been started in New York.

The most important source book in the psychology of adolescence that has appeared in the last two years is Healy's (**21**) large volume based on five years' study of 1,000 recidivists in crime (repeated offenders) from the Chicago Juvenile Court, averaging between fifteen and sixteen years of age. The point of view of the author is that of the medical man who has acquired psychological interest and training, with the center of orientation of a psychoanalyst. (For a *Literaturbericht* on Delinquency see Southard, E. E., in the PSYCHOL. BULL., 1915, **12**, 268–270 and on Feeblemindedness, Kuhlmann, F., in the PSYCHOL. BULL., 1914, **11**, 193–202.)

Baldwin (**2**) followed the same group of children for from five to thirteen years in physical growth and school progress, and a retarded adolescent boy daily for two years (**3**). Heck (**22**) used the Courtis reasoning tests in arithmetic for determining fatigue and concludes

that normal, healthy children can meet the daily requirements of school without injury to their health; more is accomplished in the afternoon than in the morning but with less accuracy. Peters and Nemecek (45) tested 118 children ranging from fourteen to twenty-four years of age. They used a series of 105 stimulus words, and the subject indicated whether the association was pleasant or unpleasant. The emotional experiences predominated over the indifferent and the pleasurable ones were in excess. Eng (13) took as her problem on children between ten and a half and fourteen years of age: What is the effect of an abstract starting point on a series of associations? and found that the rate of response to abstract terms was twice that of the concrete, the interval decreasing with age. Evard's (14) experimental study of adolescence has not been accessible to the reviewer. Koch (33) finds the "average child" uses perhaps the same "time worn" (?) 8,000 words. In a short article on the age of loyalty and coöperative play, Reany (47) stresses the primitive instincts and the value of the Scout movement. McLaren (37) compared the Australian and German children as representative of national ideals and makes a well-supported attack on the German schools, which are grinding and oppressive, but he commends the thorough methods of instruction. This article has special reference to adolescent suicide as caused by parental suppression and scholastic competition.

The subject of coeducation during adolescence has received little attention in literature of late. Several preparatory schools in the eastern part of the United States, however, are differentiating the sexes during high-school age. In Germany Meumann (38) took up the subject of the pros and cons of coeducation and coinstruction under fifteen theses, and Nef (40), in a long and suggestive article, has discussed the possibilities of coeducation in the *Gymnasium*.

Misdirected Education.—Gillingham (18) made an individual study of a child's struggle to overcome difficulties arising from a number of complicated causes such as left-handedness and inability to grasp certain sounds, improvement resulting under a system that permitted advancement by subjects. Otis (41) reports on a temperamental girl of average ability but strong passions who, from lack of control and influence became unable to adapt herself to the normal conditions of life; and on (42) a morally deficient girl of good parentage but over-indulgent training; and on (43) a girl from a respectable middle class family, who, while mentally normal, was a so-called moral imbecile and was found by instruction

and association tests to be incapable of grasping abstract ideas. Catlin (10) has given an individual study of an incorrigible child and her treatment during a year. Williams (57), in a study of three delinquent and six backward Jewish children, concludes that the social service follow-up method enables the examiner to draw many conclusions that are not evident from a mere physical and mental examination. In a study of thirteen clinical cases, which were followed up after four years, Barnes (7) emphasizes the value of clinical recommendations especially in cases due to lack of parental control. Hinckley (23), in a six weeks' study of a deficient boy suffering from deafness and muscular incoördination, points out the effectiveness of certain psychological suggestions. Baldwin (4) made a study of a delinquent mute of poor parentage and bad environment and attributes the retardation primarily to suppressed emotions. From the standpoint of a social-psychological study of the lawless boy and neglected girl, True (53) gives a very careful survey of delinquency in urban communities.

Vocational Guidance.—Within the past two years there has arisen in this country a body of literature in a specialized field in the psychology of adolescence under the title of *vocational guidance*, in which teachers and psychologists, acting as counsellors, aim to determine a boy's or girl's capacities, characteristics, traits and dominant interests with a view of formulating criteria for anticipating the degrees of probable success in certain vocations or professions.

Kelley (29), in this connection, contributes from the standpoint of method a valuable monograph on the analysis and prediction of ability of high-school pupils. The essential contribution of the monograph is the method of calculating the correlations between the estimate of a person's fitness for a task, and his later performance in it. Puffer (46), who has given particular attention to the boy and his gang, has issued a book on vocational guidance which rests on the presupposition that "true education fits for life." Seven common vocations are discussed in detail, and the professions and vocational guidance as constructive social forces in general. Davis (12) published a book on vocational and moral guidance which attempts to outline methods by which the individual boy or girl may be led to determine his bent by means of outlines of classroom conferences for pupils from the seventh to the twelfth grades; and Brereton (8) emphasizes the influence of vocational guidance on character development. In Chapter XXIV of Johnston's *Modern*

High School (28) Bloomfield, who was active in initiating the movement four years ago, gives a method of approaching vocational guidance, and in the following chapter Ruediger calls attention to the need of avocational guidance. A timely little book because it deals with girls is that of Weaver (56), in which the author has endeavored to summarize the conditions of gainful occupations for women. Hollingworth (24) maintains that vocational psychology up to the present is a typical case of the method of trial and error and after outlining the methods of vocational miniature, vocational sampling, vocational analogy and miscellaneous empirical tests, he emphasizes the value of sustaining interest in the practical use of the psychological laboratory and the need of caution in too generous prophesying.

A report of the National Vocational Guidance Association, held at Grand Rapids in 1913, has been published by the United States Bureau of Education (54) and treats the subject in a comprehensive way from the social, economic and educational aspects, with special reference to application to the public school system. Among the papers based on general principles of educational psychology are those of Professor Mead, Mrs. Woolley and Mr. Ayres, who supplements his former review (1) and treats primarily psychological tests, calling attention to the work of Thompson, Münsterberg, Whipple, Ricker, Seashore, McMillan, and Lough. The Iowa State Teachers' Association's report (26) is based on a statistical and questionnaire study of school eliminations, the vocations open to boys in Iowa, the wages paid, the relative difficulty of obtaining employees, etc. From this data certain conclusions are drawn, namely, that educational guidance is the first step and, as a corollary to that, there is needed the vocational counsellor, who shall see that the abilities of each child are discovered, educated and utilized as far as possible. Butler (9) claims the past has proven our school system an expensive institution for the adaptation of the few to the conditions of life; we need reorganization with a view to vocational guidance and the use of industrial plants and laboratories. Righter (48) contributes to the data on this subject a type survey which calls for a preliminary study of the social and economic conditions in the community where vocational guidance is required. Claiming that the increasing tendency toward specialization as well as elimination of students before that time makes vocational guidance of grammar-school pupils advisable, Greany (19) gives an account of an experimental

course on vocational guidance including lessons on general occupations covering the general characteristic needs for success. King (32) treats the new movement for social efficiency and vocational guidance in a general way. Thompson (52) considers that psychological tests of vocational guidance are more useful for elimination than for evaluation of an individual's capacities. In the Boston schools each elementary school has two teachers acting as official vocational counsellors, one who deals with children leaving school for work, and the other who advises parents and pupils concerning the high-school courses. In the industrial schools the vocational assistants have a two-fold work, studying the situation and studying the pupil.

A practical pedagogical method of approaching the problem is to have persons who have obtained some degree of success lecture or hold conferences with boys and girls, with a view to helping them to see the advantages, disadvantages, and difficulties of the vocation or profession. Horton (25) presents the plan of vocational guidance in Mishawaka, which includes a vocational survey of the city; differentiation of courses for guidance purposes; collateral reading on vocational guidance in the English department of the high school; the use of assembly periods for talks on vocations by men and women in them; conferences with the eighth grade on the vocational value of the high school, and with the graduating class on their preferences. Hanus (20) emphasizes the fact that vocational guidance "does not mean prescribing a vocation; it does mean bringing to bear on the choice of a vocation, organized information and organized common sense."

Moral Education.—That an empirical course in morals centering around the general concept of citizenship and physical development can be formulated into a usable text for adolescents has been demonstrated to an unusual degree by Taylor (51), who has given a practical graded school course correlating lessons in general morals, citizenship, domestic science, physical training, vocational guidance and recreation. Johnson (27), on the later periods of high school, shows that if approached in the right spirit boys are thorough-going idealists who welcome a discussion of moral action. His informal conference methods of discussing habit, gambling, profanity, self-control, loyalty, club life, etc., show a first-hand sympathetic understanding and rare insight into the complex and interesting traits of adolescents. Sneath and Hodges (49) offer a book of the older, hortatory, moralizing type, laying emphasis

upon the indirect method of moral training through the school and home. McKeever (36) has produced several books for boys and girls of a moralizing but also of a practical type. Kuno (34), in a discussion of the physical, intellectual and moral characteristics of the adolescent boy, has attempted to show how the teacher may utilize these by indirect methods for the building of self-control in character. In a study of 425 colleges and universities Baldwin (5) finds that 125 institutions have a formal Honor System and the success of the movement is attributed in the main to the natural desire of the post-adolescent students to formulate ideals for themselves, the interest for coöperative activity and team work, and the pride involved in creating college public sentiment and college loyalty.

Adolescence and the High School.—Among the newer conceptions and aims of the high school Davis (11) emphasizes the necessity of making the high-school conform to the changes that occur during adolescence. A flexible program that gradually trains in the elements of choice, that gradually relaxes external authority and repression, and that increases powers of forming analyses, judgments, and volitions is recommended. Stout (50) lays stress on the social instincts of the adolescent as having marked bearings upon the function and organization of the ideal high school. Lewis (35) devotes chapters II and III to a semi-popular discussion of the high school and the boy, and the high school and the girl, illustrated plentifully by cases of the inability of the high school to meet the needs of the average boy or girl. In Monroe's *Principles of Secondary Education* (39) Whipple gives (in Chapter VII) a summary of the psychology and hygiene of adolescence with an application to formal discipline and intellectual growth during adolescence. In Johnston's *Modern High School* (28) are to be found several chapters bearing indirectly on adolescence. Parker (44) finds both the instinctive and habitual interests of adolescents of great importance in methods of teaching and his analysis of the learning processes in economical teaching rests on a more thorough knowledge of high-school boys and girls on the part of high-school teachers.

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EDUCATIONAL PSYCHOLOGY

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Texts in Educational Psychology.—The most significant contributions of texts in the rapidly growing experimental science of educational psychology during the past two years have been made by Judd, Meumann, Stern and Thorndike. In a vigorous, clear and scientific manner Judd (**47**) has helped blaze a new line of psycho-educational research in his text on the applied psychology of high-school subjects. In opposition to Hall's method of describing the mental traits of adolescents the author advocates an inquiry into the mental characteristics typical of each branch of learning pursued by the adolescent, which combines the principles of general and individual psychology.

In the psychology of the concrete subject of geometry, for example, the origin of space perception is traced as a relational type of consciousness for a basis only (since geometrical analyses involve different mental processes that are dependent on spatial perceptions) and the analysis of algebra is based on the psychology of number and abstraction. The psychology of language first received adequate treatment in Wundt's *Völkerpsychologie,* as a definite and important kind of behavior implying incipient motor reactions with general mental tonus. English teachers, through lack of motive and content, substitute form, specialization, rhetoric and dissection for appreciation, interpretation, and the expression of experience and findings. The psychology of skill includes writing

and industrial arts. Science is a body of generalized knowledge and the treatment is, aside from the discussion of laboratory methods, anthropological in method. The fine arts evoke inner reactions that are extraordinarily difficult to analyze and control and this in a measure explains their vagueness and consequent neglect in schools. In history the broad general educational principle is stressed and the author then takes up his analysis of "generalized experience" in which he finds no one advocating "formal discipline" in the extreme in which the opponents would have them, nor are they greatly at variance with Thorndike's "identity of procedure" and "identity of substance." No one denies the fact that there is transfer of training, according to Judd, and the real problem is that of degree of transfer, which he finds depends on the power of generalization. The formula of identical elements of experience is absolutely without value; if a subject does not give generalized training it is not the fault of the student's mind but of the method of instruction. The chapter aims to present a sharp contrast to the doctrine of "specialized mental functions" with particular reference to Thorndike's views.

Meumann's last volume (**61**) of his *Vorlesungen zur Einführung in die experimentelle Pädagogik*, in which he sets forth the experimental results in the field and their pedagogical significance, marks the completion of a masterly production in constructive education.[1] Stern (**84**) has given remarkably keen analyses and descriptions of child behavior from a psychological point of view from the kindergarten period up to six years, which is a contribution of permanent value in the field. The author's broad knowledge of psychology, his careful technique in giving mental tests and his sympathetic appreciation of the meaning of childhood are apparent throughout the book.

Approaching the subject from the point of view of a detailed study of original tendencies (reflexes, instincts and capacities), Thorndike (**88**) has condensed the material of his three recent volumes on educational psychology into the most scholarly, lucid, and best organized text we have under this title (**87**). The aim of education consists in perpetuating the original tendencies that change the individual for the better, eliminating, redirecting, or modifying others. The first nine chapters of the text consist of an analysis of the human tendencies, their characteristics, the extent to which they are modifiable, their anatomy, physiology and

[1] For special review see p. 400 of this number of the BULLETIN.

function. With an analysis of learning in animals as a basis, the next eleven chapters treat of learning in man with special reference to mental functions through associative learning, learning by analysis and selection, the amount, rate, limit, conditions, change, and the permanence of improvement in learning processes, with the effect and limitations of transfer of training, and the conditions of mental fatigue. The last seven chapters deal with the psychology of individual differences and their causes from the standpoints of race, sex, heredity, maturity and environment; on mental life in general and on single traits and combinations of traits in particular. In addition to the author's own source material the experimental contributions of 99 other investigators are cited in the text, and of these many have been associated with the author in working out their own particular problems. In the text, however, one finds the problems of individual differences in physiological age almost entirely neglected and a very brief account of the higher mental processes which necessarily form a large part of the teacher's work. This book shows a remarkable advance in the biological concept of the aim of education since James championed this general view a quarter of a century ago.

A second edition of Whipple's *Manual* (**95**, **96**) has been expanded into two volumes in order to include the rapidly increasing number of investigations. Many pages show evidence of revision in order to include new literature and supplementary illustrations, charts and tables; the literature on the Binet tests has been omitted from the second edition. Approaching the subject historically, Anschutz (**2**) treats the psychology of the higher and more complex mental processes involved in *die Intelligenz*, with particular reference to graded mental tests and educational applications in their bearing primarily on the psychology of attention, judgment and reasoning. Hahn (**38**) has discussed the relation of experimental psychology to education. Valentine (**92**) has attempted to produce an experimental type of educational psychology text. Part I contains methods of giving experiments; Part II, under corresponding chapter headings, discusses the theoretical and practical significance of the experiments. Hollingworth's (**42**) experimental psychology has a number of good psycho-educational experiments.

West (**94**) has written a text from the English empirical point of view with some fundamental principles outlined in a coördinate manner. Some of Winch's (**98**) important studies have been issued in a monograph under the title of *Children's Perceptions*.

Eight series of experiments were conducted in schools with boys and girls and the results are tabulated with reference to the perception of clothes, position, activities, things, number, color, and to the development of perceptual attitude. Dumville (27) published a guide primarily for preparation for teachers' examinations and as an introduction to the subject of educational psychology which gives an account of some of the physiological traits in the development of the child mind. Magnusson (58), in an elementary and comprehensive treatment for normal school classes, approaches the subject from the biological and neurological points of view, discussing in turn the intellect, the instincts and feelings, subconsciousness, child study, and pedagogical applications of psychology. In a popular but sane and suggestive book for parents, teachers, and ministers, Gruenberg (37) treats child life intimately from the genetic point of view on the subjects of fear, instinct, imagination, will, reasoning, ideals, and social development. Kleinpeter (51), in his comprehensive treatise, which includes discussions on fatigue, child and individual psychology, brings together considerable historical material and assembles data of direct educational import. The third edition of Offner's *Das Gedächtniss* (66), which treats primarily of the relation of experimental psychology to education, should be mentioned as a significant contribution to educational psychology, as well as the first, second and third volumes of Thorndike's (88) larger study in educational psychology, which have previously been reviewed in the BULLETIN. Schulze (79) has also issued a third edition of his experimental educational psychology and Wundt (101) a new edition of his *Einführung in die Psychologie.*

Strayer and Thorndike (85) published in 1913 a volume on educational administration including studies by advanced students on age and grade, promotion, retardation and elimination, individual differences among pupils of the same grade, and studies of the teaching staff. Wallin (93) has asembled, and supplemented, a number of his magazine articles into a volume which gives the history, distribution, purposes, and methods of psycho-educational clinics in this country. Swift (86) generalizes the results of his and other investigations and applies them to representative types of school work. He maintains that all education should be "learning by doing" and that the laboratory and workshop methods should be introduced into all subjects. Dewey and Dewey (25) have just published the best recent contribution on contemporary educational tendencies based on Professor Dewey's philosophy of

education and the psychological principles of Rousseau, Pestalozzi and Froebel. The book carries further the aim of education as set forth in *School and Society* and selects as "the schools of to-morrow" a limited number of "experiment stations." Though these schools differ among themselves, they represent the thesis—"*To find out how to make knowledge when it is needed* is the true end of the acquisition of knowledge in school, not the information itself." For students who approach educational psychology from the neurological point of view, Dunlap's (**28**) outline furnishes an excellent detailed guide.

Experimental Educational Psychology.—It is not possible at the present formative stage of educational psychology to differentiate clearly at all times experiments of educational import from those of pure psychology, since new and unanticipated applications are constantly being made.

Myers (**65**) concludes that there is a decided gain in final recall as a result of intervening recalls without a re-presentation of stimuli, and this gain is greater for a five-minute period of recall than for an immediate one. The effect of intervening recall is very much greater when final recall is taken after thirty minutes or one hour than when taken at the end of three weeks. Wyatt (**102**) tested the immediate memory of thirty-eight children of both sexes, ranging from 10 to 12 years, by means of nonsense syllables and concrete terms, digits, and narrative. The highest correlation was between nonsense syllables and concrete terms; the lowest between narrative and digits. Dockerill and Fannings (**26**) have formulated a test for reasoning composed of ten familiar proverbs. Each pupil was asked to give the best illustration of each proverb that he could recall. The results show high correlation with examination marks and with teachers' estimates. Hunter (**44**) draws a distinction between "form" perception and "pattern" perception. It is to the total setting or pattern that animals and children react. Geometrically (to the child), the form is more complex than the total setting, because it is not yet analyzed out. In an experiment on formal discipline, Kline (**52**) had two groups of nine adults each practice for two periods in cancelling from a printed page given parts of speech. In the final test, the practiced group showed only small gains for nouns, verbs and prepositions, and losses for pronouns and adverbs, whereas the unpracticed group showed distinct gains for all parts of speech. Lyans (**57**) compares the contentions of various studies in the subject of formal discipline, and finally

states the issue as a question: "What are identical elements and what principles control the transfer of learning in them?" The conclusion is that "all learning from experience, all thinking, all inference, is transfer; there are only differences in degree." Chapman's (17) problem is whether there is any such thing in mental achievement as general improvability. The author finds small but constant correlation between initial abilities, and a very slight inter-correlation between improvements.

The problem of the psychology of learning has received a great deal of attention in the last few years, and for a *Literaturberich* of other references the reader is referred to Baird's *Memory, Imagination, Learning and the Higher Mental Processes* (PSYCHOL. BULL., 1914, 11, 305–324; 1915, 12, 333–354.) By no means least among these contributions is that of Professor Baird's excellent translation of Meumann's (62) *Oekonomie und Technik des Lernens.* The book approaches a discussion of learning processes through an analysis of the function of memory, and the subsequent chapters discuss respectively, the relation between perception and memory, including experimental investigations with particular reference to children; associative learning, including memory types; conditions and technique of mechanical learning; stages of learning; retention and forgetting; the education of memory in the schools, etc. Hahn and Thorndike (39) tried measuring the effect of practice in arithmetic under school conditions, and concluded that properly administered speed drills will improve accuracy as well as speed; that the evidence is in favor of longer periods of practice; and that equal practice on groups of different initial abilities within the same grade increases rather than reduces the initial differences.

To ascertain what mental differences exist between groups of bright and dull pupils, Pyle (70) gave group tests in logical memory, rote memory, word building, association, and completion to the children of six different Missouri city schools. Good pupils are a trifle more than a year younger than poor pupils within the group. In a normal school class Scott (80) had each member estimate the relative "brightness" of the other members of the class and found a high correlation between the judgments of the different members of the class. The tests tried in comparison with these different estimates were rote memory, progress in reading upside down, tone discrimination, acquisition of ideas in reading from the printed page, retention of ideas for a week, range of information, two

completion tests, and quickness in crossing out *a*s and *t*s. Results of the tests show that one could prophesy with a high degree of approximation when these pupils entered the school (if the tests were applied then) just what pupils and teachers would think of them as far as "brightness" was concerned, six months afterward. Meriam (60) determines the aims and methods of education by the pupils' immediate needs rather than preparation for high school. The seven years' course consists of four "studies": Observation of nature and industrial activities; playing games of present interest; handwork—making things of immediate usefulness; enjoyment of stories, pictures, music. Reading, writing, arithmetic and the so-called common-school branches are not taught as such at all. Finklestein (33) gives a detailed and very suggestive study of the marking system with 29 distribution charts of the grading in various courses at Cornell University; Rugg (75) and Kelly (49) contribute studies of standards of marking in elementary schools, high schools and colleges, and of marking examination papers, also an analysis of standard texts as aids in standardization. Deuchler (24) gives an historical and critical discussion on methods of computing correlations between pedagogical and psychological material including that of Spearman and contemporary Germans. In America a number of small psycho-educational laboratories and clinics have recently been organized in connection with universities, colleges, normal schools and city school systems. In Germany last year Rupp (76) began a series of articles outlining in detail methods and apparatus for work in experimental education. The first article deals with color perception, including after images, contrast, brightness, intensity, saturation and similar phenomena; the second article describes experiments in visual space perception and the anatomy and physiology of the eye; and the third article analyzes visual illusions with experiments supplementary to those commonly used in psychological laboratories.

Rosanoff and Rosanoff (73) are endeavoring to determine, "At what age in childhood or in youth do the associational tendencies as they are observed in normal adults become fully developed?" The conclusions indicate that children of eleven approach mature associational tendencies but before that age give a large number of doubtful and individual reactions and failures of reaction. Roemer (72) gives a comparison of abnormal with normal children in a free association test. He found that "The associations of abnormal children differ from those of normal children, particularly in the

use of adverbs and pronouns. They have fewer preferred associations than normal children, and these are frequently of different type."

To determine whether reaction time was largely conditioned by ability to articulate, Hollingworth (43) tried tests on 19 people, in which after each individual had gone through tests 100 times, he was given a sheet on which was typewritten in the case of the color naming test, the names of the colors and the opposites that the subject customarily gave. He was allowed to read these five times as quickly as possible, and the reading and articulation time were recorded. Then the test records were consulted and an initial and final average made from the first five and the last five of the 100 trials. It is apparent, since association times do not at all approach the limits set by articulation reading time, that a considerable time is required for something else. The correlation between reading and articulation time is .70. Kuhn (54) has studied in an elaborate manner the effect of recitation and reading on *Einprägung*. Benson (11) attempts by rather fantastic psychological and pedagogical tests to determine sense training, judgments, and knowledge as applied to everyday life. Demeny (23) gives a discussion of the physiology and psychology of effort, which reveals little knowledge of modern psychology, but is sound and wholesome in its emphasis upon controlled effort. Winch (99) has formulated a set of problems in mental reasoning such as would enable the child to adapt himself to social conditions. Ziehen (105) has published a very comprehensive little treatise of 23 chapters, the chief of which discuss the original idea of angles and their development. Koch (53) has made a careful, painstaking investigation into the feeling qualities which is of pedagogical import.

General Studies in Educational Psychology.—Eliot (29) finds that we have already accomplished a great enlargement of education by means of special schools but we need a changed curriculum and newer methods of teaching. We need for democracy, instruction in economics; for industry, vocational instruction; and for the pleasures of life, the larger training of the senses. Russell (77) compares the average age of graduation in secondary schools in the United States and Germany, and analyzes the elements of the German methods of instruction that make for economy of time and which we might use advantageously, such as the six-six plan, triple division of the recitation, correlation of the subject matter, and specific training. Baker (5) by means of a questionnaire elicited

the general concensus of opinion that the school courses are too long; that economy in the selection of subjects, topics and in methods will save approximately two years in the whole period of general education. With greater efficiency in the earlier periods, the college course may well end nominally at 20 instead of 22. At University of Chicago this problem is being worked out experimentally. In this line of effort Kennedy (**50**) has issued a detailed account of his Batavia system of individual instruction and Burris (**14**) has summarized Wirt's Gary system, which rests upon a careful consideration of the needs, motives, capacities and interests of pupils.

Ogden (**67**) finds one important point of contact between psychology and education through the principles of the new thought psychology in reference to learning. Huther (**45**) treats the problem of pedagogical psychology with particular stress on the inductive and deductive methods and Meumann's experimental data. Adler and Furtmüller (**1**) have printed a large collection of the essays and papers given at Brussels at the international congress on *Pédologie*. Among the topics included are: the doctor as an educator; educational errors; obedience and obstinacy; education of parents; strictness in education; psychology as a practical calling; and the choice of a profession. In a general discussion of an *a priori* nature, Schroeder (**78**) claims more time should be devoted to the psychology of conduct or behavior in order to make a psychological study of the springs or sources of conduct, which he claims Bagley has failed to do in his discussion of "attitudes." In his applied psychology Münsterberg (**64**) takes as his thesis that "He (the educator) must supply information, must train pupils in certain abilities and must awake in them certain interests." Yocum (**104**) formulates the problem of education by analyzing current generalizations into a multitude of specific problems bearing on experimentation, with particular reference to general culture, discipline, and democracy in relation to the course of study.

In analyzing the purpose of education from the standpoint of contributions from experimental psychology, Pitt (**68**) stresses the psycho-physical complexes of memory, mood, motive and character, with particular reference to the contributions from the Society for Psychical Research. Baldwin (**6**) analyzed Locke's aim of education and denies that he is a good example of the disciplinary school, where he is usually classified.

Thorndike (**90**) has made a keen critical analysis of the applica-

tion of psychology to education, supplemented by a constructive program o work. Wilbois (97) has emphasized voluntary and emotional development in his discussion, Cellerier (16) has given an outline of the education of the will, Enriques (32) has made a study of the relation of memory to education. Baratono's (10) discourse on education Ioteyko (46) on the aim and tendencies of education, and Marchesini's (59) treatise have not been available for review. An important contribution from the methodological standpoint in education is that of Hartmann (40). Baldwin (8) reviews fifty-four papers on experimental educational psychology.

Measuring Scales.—A well-defined movement has arisen in this country during the past two years for measuring experimentally the standards of efficiency in the teaching of various school subjecst, norms for school room situations, and the abilities of pupils from a psycho-educational point of view. These scales, as a rule, have been worked out inductively with approximate norms and arranged in an ascending series of units for comparison with individual or group efforts. The present need is for a more careful application in schools rather than propaganda, since many older reactionists in education are widely condemning on *a priori* grounds efforts toward any standardization.

That measuring scales are beginning to take a direct hold on the public schools is being demonstrated by the coöperative research plan organized between the Department of Education at Harvard and the city of Newton outlined by Learned (56). The first Harvard-Newton bulletin by Ballou (9) includes the preparation of scales for measuring description, exposition, argumentation and narration. The Hillegas (41) scale for measuring English composition, obtained by a study of a large number of compositions, which have been graduated on the basis of the combined judgment of one hundred persons to whom were sent compositions selected from those of 7,000 children. In order to secure compositions of the lowest merit, it seemed necessary to insert eight artificial samples. As soon as the scales are refined to include narration, description, argumentation, exposition, and perhaps other types of English work, the measuring capacity of teachers of composition may be tested out. Elliott (31) maintains "that a group of a dozen competent superintendents, of relatively small school systems, working together on this problem could do more in a single year in the production of a workable method for the determination of the merit of teachers than could a hundred superintendents and non-superintendents working alone for a generation."

In reading, Starch (**81**) bases his evaluation of the measuring scale on the chief elements of (1) speed, (2) comprehension, and (3) correctness of pronunciation (which has not been worked out), while the measuring scale itself consists of graded selections made from various readers. His standard values are not based on the arithmetical but on the smoothed values of the scores of 3,511 children of seven cities, rated for speed and comprehension. More data and much more adjustment will be required before the scale approaches accuracy. Brown (**12**) in a plan for the measurement of pupils' efficiency in silent reading takes account of rate, quantity and quality. The results of these three measurements are reduced to standard units of reading efficiency by multiplying the number representing the rate by the average reproduction. Judd (**48**) discusses the need for standard tests in reading and submits a selection to serve as test material for ability to get the meaning of the passage by silent reading. (For additional references see Cameron, PSYCHOL. BULL., 1914, 11, 329–330.)

Davies (20) attempts to measure arithmetical ability on a comprehensive scale. He states as his purpose an effort to discover a simple way of testing general efficiency in arithmetic or special ability in any particular department of work. His results show a wide diversity in individual capacity, but a close approximation to arithmetical efficiency as measured by the term grade. Baldwin's (**7**) investigation of the application of the Courtis tests to 200 college students showed that these students ranked tenth grade or above, and a positive coefficient of correlation was found between the various processes with a range of distribution from .24 to .56. Lane (**55**) tried the Courtis tests (**19**) on a whole school system, and found that the efficiency of a whole school might be raised in a short time. At the same time he points out that 16 per cent. individually lost in speed and 6 per cent. in accuracy while 9 per cent. made no change in speed and 5 per cent. no change in accuracy. Monroe (**63**) attempted to establish a scale in fundamental algebraic ability. The author found a wide distribution of accomplishment indicating the need for more than one type of training, and decided sex differences in that boys showed more accuracy than girls. Cajori (**15**) doubts the practicability of measurements in secondary mathematics, but advocates a preliminary "array" of pupils according to memory tests, original exercises and diligence in class work, and on the basis of this data an assignment of each pupil to a place on an abstract scale constructed according to the normal frequency curve.

A five-group system based on the amount of deviation from the mode would seem to be the most convenient method for recording standing.

Material for Starch's (82) spelling scale is composed the first word of every odd page of the dictionary. After all technical words were eliminated, they were placed in groups of one hundred words each, putting the words in order of length. The same test of 100 words is used for all grades, thus eliminating the chance of the words being too easy for brighter pupils in a grade, and making it possible to measure grade to grade progress, which, he believes, cannot be done satisfactorily with the Ayres or Buckingham scales. Buckingham (13) aims to derive a scale for the measurement of spelling ability, and to show some of its uses and applications. Words are arranged on a linear projection in such a way that the words from the lower to the upper end of the measuring scale are located at intervals determined by the difficulty of each word. Such a scale will, he thinks, enable us to measure the spelling ability of any individual and to determine in relation to known values the difficulty of any word in the language. The scale was obtained inductively from words found difficult for 8,791 grade children in New York City. Ayres (3) has formulated a spelling scale based on the vocabularies of a large number of personal and business letters.

Ayres's (4) scale for determining the quality of the handwriting of adults is similar to the scale for measuring the handwriting of children issued in 1912 which has been so widely used. Starch (83) discusses the reliability of the Ayres and Thorndike scales for the measurement of handwriting as tried on 4,074 pupils in 19 schools in eight cities located in Wisconsin, New York, and West Virginia, and concludes that both scales show a high degree of relativity and are far more accurate than the old percentile basis of marking. The Thorndike scale he finds preferable for grading a large variety of children because it extends further at the upper and lower limits.

Gray (36) advocates the training of judgment as a necessity in evaluating scales. He gives as an example the use of the Ayres scale, where it was found that the evaluation was dependent upon the general impression of the teacher, but according to his method the general impression was checked by a set of details, including letter formation, execution, mixed slant, indistinctness, carelessness, size and legibility. Freeman (34), after making an analysis of the handwriting movements of adults and children, found that writing is characterized by a decided rhythm which is more pronounced in

the developed than the undeveloped movement. The writing of children is less rhythmical, less organized, and less automatized. The monograph consists of an historical sketch, description of the apparatus, and discussion of the results. Subsequently, after a criticism of the Ayres and Thorndike scales on their lack of uniformity, Freeman (**35**) presents an analytical scale.

Rugg (**74**) has derived a scale for measuring free-hand lettering by an evaluation of 1,500 papers of engineering students, graded on a per cent. basis, and covering the component elements of block lettering, height of letters, spaces, stems and ovals. The results of six instructors and 300 students show an equal distribution above and below .75 and the students show a gain in accuracy over past years when the scale was not in use. Thorndike (**89**) has also published an explanation of the methods of obtaining a drawing scale and its use. It is still in the formative period and for the present is based on general rather than individual merit.

The bulletin of the recent Indiana Conference (**69**) on educational measurements includes "Giving of Tests in Reading," "Individual Differences and their Causes," "Units and Scales for Measuring Educational Products," all by Professor Thorndike; "Organization of School Surveys," by Supt. H. L. Smith; "Use of Courtis Tests," by Mary Kerr; and "Elementary Teachers and Coöperative Research," by M. E. Haggerty.

Dawson (**21**) has attempted to measure the results of the use of common botanical objects for identification by 97 graduates of high schools. His conclusion, which is a blanket statement with little psychological insight, is that they fail to recognize things in their environment, that lack of knowledge was due to lack of interest, and that they therefore failed in concise thinking and accuracy of expression. Beginning with data based on tests of scorings in spelling and writing, composition, vocabulary, arithmetic and other data, Elliott (**30**) discusses the standards of achievement for the 5th and 7th grades, attainment in class measurement of class size and in an appendix gives directions for administering these tests, samples of others, a preliminary list of composition subjects, notes and a bibliography.

Courtis (**18**) in a discussion of educational diagnosis takes as his thesis that the schools already provide ample opportunities for those able to learn, and that the efficiency of school work can most easily be increased, not by increasing the opportunities provided, but by making for each child an individual adjustment of work

based upon its measured needs. He prophesies that by "systematic educational diagnosis of the causes which prevent the success of individuals, and by the application of proper remedies, it will be possible for an ordinary teacher to have 75 per cent. of her children growing, in place of the conventional 30 per cent."

Rice (71) maintains that a new basis of supervision is needed, based not on what the teacher knows or what methods she employs, but by what she accomplishes. The basis of this accomplishment is to be determined by the class standing derived from efficiency tests. Decroly (22) has devised a scale, free from the charges brought against the Binet scale of laying too great stress on the use of words, by means of sets of pictures representing a story. The task of the child is to arrange them in a logical order and the results obtained lead the author to think the experiment a promising one. Trabue (91) has formulated a general intelligence scale based on Ebbinghaus's completion sentence method. The Yerkes, Bridges and Hardwick scale (103), an adaptation and elaboration of the Binet-Simon scale, formulated on a suggestion made by the late Dr. Huey, is the most promising measuring scale for general intelligence so far available. The scales consist of twenty groups of tests for application to each individual including motor coordination; visual perception; visual and kinæsthetic discrimination; association; suggestibility; auditory, visual and other types of memory; imagination; æsthetic, practical and logical judgment; analysis, comparison and ideation. For each test within each group there is a quality estimate of performance in opposition to the "all-or-none" principle, which is indicated by a credit of one, two, three or four points. For example, four gradations are recognized in the free association tests and two in definition of concrete terms. After trying out the tests on a limited number of normal, delinquent, blind and deaf mute children the reviewer has found the series to have a great many advantages over the Binet, such as the allowance for individual differences in mental traits, and differences for social, racial, industrial, sex and pedagogical classes. Another strong feature of the scale is its applicability to the earlier adolescent ages, since the norm for fifteen years of age is probably not over 85 per cent. of the possible number of points. Some of the limitations of the scale are: the evaluation and assigned points are arbitrary and will require considerably more trying out before norms can be established; like the Binet scale the affective phases of mentality are about neglected; some of the analogies and sentences

need further revision. Chapter XII projects in outline form a universal point scale for all ages, including the affective side of mental life.

Witmer (100) in formulating a series of scales for measuring the relation of intelligence to efficiency differentiates two kinds of human performances usually connoted by the term efficiency and proposes the use of the words *competency* and *efficiency*. Competency and intelligence are teleological concepts and efficiency is a mechanical concept. For diagnostic purposes a distinction is also made between grades and levels of intelligence. Twelve scales are outlined for a differential diagnosis of intelligence for the grading and leveling of individuals or groups based on *grades* of intelligence and efficiency, and *levels* of growth, sex, culture and normality. The growth levels rest on the phylogenetic and ontogenetic distinction. The sex and culture differences are suggestive but not new; in the normality level, the deficiency scale is based on Witmer's theory regarding children with "mental defects" as contrasted with "mental defectives" and a classification of these children is promised.

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SPECIAL REVIEW

Vorlesungen zur Einführung in die experimentelle Pädagogik und ihre psychologischen Grundlagen. E. MEUMANN. 2te Aufl. III Bd. Leipzig: Engelmann, 1914. Pp. xvi + 919.

With this ponderous tome the author brings the revision of his encyclopedic work on experimental pedagogy to a conclusion. It is monumental in its size, in its scope, in its penetrating analysis, and in the fact that it comes as the crowning effort of a life of untiring industry and enthusiastic investigation,—for barely four months after the last word was written a sudden illness stilled the active brain forever.

Almost every page of the book reveals the catholicity of the author's reading, and it is easy to understand why in the last paragraph he proclaims the international character of pedagogical investigations and laments the unhappy world war which threatens to destroy the best in European civilization and to overthrow the great structure that education has painstakingly built up.

The first chapter of the book, which is the fourteenth lecture of the entire series, deals in one hundred and fifty-five pages with the mental work of the school child and its relation to the methods of the teacher. There is a discussion of the psycho-physics of work, a psychological analysis of work, with especial reference to the Kraepelin methods of investigation, and a section on the economy and technique of mental work. The author finds himself in entire agreement with Thorndike's searching criticism of Kraepelin's explanation of the work curve, and believes that the conditions are so complex that much more experimental work is needed before valid judgments can be passed on the factors involved.

In the last section of the chapter Meumann reaffirms his belief in general training, recounts his early experiments (which Dearborn has shown were without adequate controls) to prove the transfer of training in memorizing, summarizes the work of others, notably Winch, whose results are favorable to this view (the recent careful work of Sleight is entirely ignored), and lays great stress on the value of formal training as an educational procedure. It must be confessed that the arguments offered in support of this position impress the reviewer as particularly weak. General or

formal training, resulting from practice in any type of act, is said to be due to the accompanying training (*Mitübung*) of general mental functions (as attention, will, emotional attitude, etc.) involved in the performance of the act in question, and is supposed to increase in amount as the learner's interest in the immediate outcome of the particular practice decreases. This presupposes the existence of general mental functions in an extremely abstract but marvellously efficacious form, and, as Wundt has pointed out, approaches perilously near the generally discredited assumptions of the old faculty psychology. The real question at issue here, viz., to what extent is practice in a specific activity accompanied by improvement in more or less closely related specific activities, is merely obscured by an appeal to such general mental functions.

One hundred and thirty pages are devoted to a summary of theories and experiments on mental fatigue, a field in which much work has been done, but little has been ascertained that is of either theoretical or practical significance for education. In the discussion of home versus school study the author points out that the results of experiments show the decided superiority of the latter in both quantity and quality of accomplishment, but claims that home study is really superior if it is conducted under the proper guidance of teachers, and if originality of thinking rather than formal memoriter work is demanded.

The sixteenth lecture deals chiefly with the psychological basis of observational instruction (*Anschauungsunterricht*), and contains a survey of the literature on the psychology of report and a discussion of its application to pedagogic procedure. Stern's categories of observation are criticized and amplified, particularly in the direction of the child's spontaneity, and there is an extended consideration of the order in which these phases of observation manifest themselves. As an example of the extreme insistence upon sense training the Montessori method is described in detail, and its weaknesses, its contradictions, and its extravagances subjected to an unsparing criticism.

The remaining five lectures present elaborate summaries and critical analyses of experimental work in reading, writing, spelling, the psychology and pedagogy of number, drawing, modelling, the appreciation of pictures and sculpture, and the extension of experimental investigations to secondary school subjects. Each field is treated with the same inclusiveness of detail, the same fertility of analysis, the same keen appreciation of the need of further research.

While the style is perhaps a trifle prolix, and the author's interest in the analysis of his problems causes him to raise more questions than he can answer, it will be of distinct value to the science of education to have its attainments thus catalogued, the path of its further progress pointed out, and the possibilities of the experimental method of attack clearly demonstrated.

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BOOKS RECEIVED

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NOTES AND NEWS

THE EDITORS take pleasure in announcing the election of Professor Madison Bentley of the University of Illinois to the Editorial Board of the PSYCHOLOGICAL REVIEW PUBLICATIONS. Professor Bentley will become responsible editor for the PSYCHOLOGICAL INDEX.

THE present number of the BULLETIN, dealing with Child and Educational Psychology, has been prepared under the editorial direction of Professor Bird T. Baldwin, of Swarthmore College.

THE following appointments have been made at the Carnegie Institute of Technology: J. B. Miner, of the University of Minnesota, assistant professor of psychology, L. L. Thurston, of the University of Chicago, and Margaret L. Free, of Bryn Mawr College, assistants in psychology.

AMONG psychologists who gave courses in summer schools as visiting instructors this year were Professors Bell at the University of Tennessee, Odgen and Morse at the Peabody College for Teachers, Cameron at Harvard University, Hall at the University of Pittsburgh, Buchner at the University of Kansas, and B. T. Baldwin at Johns Hopkins University.

THE department of psychology of Reed College, Portland, Oregon, plans extensive improvements in its laboratory.

AT Vineland, N. J., a new laboratory of thirty rooms is now occupied by the department of psychological research. While giving courses in the summer school at Berkeley, Dr. Goddard gave a special course of lectures to the Police Department on the psychology of crime.

DR. CHRISTIAN A. RUCKMICH, associate in psychology at the University of Illinois, gave a course of four lectures on the psychology of music at the Harvard summer session.

DR. HENRY J. WATT, lecturer in psychology at the University of Glasgow, who has been interned in Germany since the beginning of the war, has been allowed to return home.

The following items have been taken from the press:

DR. E. LASK, associate professor of philosophy in the University of Heidelberg, and Dr. W. Conrad, docent for philosophy in the University of Halle, have been killed in the war.

DR. ANSCHUTZ, docent in the Hamburg Scientific Institute, has accepted a call to the professorship of psychology in the University at Constantinople.

PROFESSOR M. ROTHMANN, of Berlin, died on August 12, 1915. His publications dealt mainly with the functions of the central nervous system, and recently he inaugurated at Teneriffe a station for the study of the anthropoid apes.

A COMMISSION for the investigation of the causes and prevention of mental deficiency has been appointed by the Governor of Indiana.

DR. G. C. BASSET, has been promoted to the professorship of educational psychology and directorship of the psychological clinic in the University of Pittsburgh.

E. HERING, professor of physiology at the University of Leipzig, best known to physiologists for his work on color vision, will retire at the close of the winter semester.